CLAIMS

1. **(Currently Amended)** A computer-storage medium storing processor-executable instructions that, when executed by a processor, perform acts comprising:

obtaining a digital good;

partitioning the digital good into a plurality of regions;

calculating rational statistics of one or more [[the]] regions of the plurality of regions, ~~so that~~ wherein:

the rational statistics of ~~a region~~ the one or more regions are representative of ~~the region~~ respective one or more regions, ~~wherein the calculating comprises generating~~

the rational statistics of the one or more regions ~~of the plurality~~ are generated via a hashing function having a quotient of two weighted, linear, statistical combinations,

weights associated with the rational statistics of the one or more regions are pseudo-randomly generated based at least upon different secret keys, one different secret key for each region of the one or more regions, ~~and wherein~~

the rational statistics are semi-global characteristics[[,]];

~~wherein numerator of the quotient is a first of the two weighted, linear, statistical combinations and wherein denominator of the quotient is a second of the two weighted, linear, statistical combinations;~~

quantizing the rational statistics;

marking the digital good with the quantized rational statistics of the one or more regions of the plurality of the regions.

2. – 3. (Canceled)

4. (Currently Amended) A medium as recited in claim 1, wherein the hashing function is represented by:

$$h_i = \frac{\sum_{j \in R_i} \alpha_{ij} s_j}{\sum_{j \in R_i} b_{ij} s_j}$$

where:

- α_{ij} is the jth element of α_i and α_i are [[a]] pseudo-random generated weight factors;

- b_{ij} is the jth element of b_i and b_i are [[a]] pseudo-random generated weight factors;

- s denotes the digital good of dimension $N \times 1$;

- R_i are the plurality of regions, where $R_i \subseteq \{1,2,...,N\}$.

5. (Original) A medium as recited in claim 1, wherein the partitioning comprises segmenting the digital good into a plurality of overlapped regions.

6. (Original) A medium as recited in claim 1, wherein the marking comprises embedding a watermark via quantization.

7. – 8. (Canceled)

9. (Currently Amended) A computer-storage media storing processor-executable instructions that, when executed by a processor, perform acts comprising

obtaining a digital good; and

using quantization, marking the digital good with a watermark, wherein: [[such]]

the quantization is based upon semi-global characteristics of regions of the digital good, ~~wherein such~~

the semi-global characteristics are generated via a hashing function employing a quotient of at least two weighted linear combinations of statistics of the regions of the digital good,

wherein a change in a hash vector space of the hashing function is mapped to a data space of the digital good and a dimensionality reduction from the data space of the digital space to the hash vector space of the hashing function occurs.

~~wherein numerator of the quotient is a first of the two weighted, linear, statistical combinations and wherein the denominator of the quotient is a second of the two weighted, linear, statistical combinations.~~

10-12. (Canceled)

13. (Currently Amended) A system for facilitating the protection of digital goods, the system comprising:

a partitioner configured to segment a digital good into a plurality of regions;

a region-statistics calculator configured to:

calculate ~~rational~~ statistics of one or more of the plurality of regions, wherein the statistics of ~~a region~~ <u>the one or more of the plurality of regions</u> are representative of ~~that region~~ <u>respective one or more of the plurality of regions,</u> ~~wherein the region-statistics calculator is further configured to~~

generate the ~~rational~~ statistics of <u>the</u> one or more ~~regions~~ of the plurality <u>of regions</u> via a hashing function having a quotient of two weighted, linear, statistical combinations<u>, wherein weights associated with each region of the one or more of the plurality of regions are correlated with one another within each region;</u>

~~and wherein the rational statistics are semi-global characteristics, wherein numerator of the quotient is a first of the two weighted, linear, statistical combinations and wherein and the denominator of the quotient is a second of the two weighted, linear, statistical combinations;~~

a region quantizer configured to quantize the rational statistics of ~~a region~~ <u>the one or more of the plurality of regions</u>; and

a digital-goods marker configured to generate a marked good using the quantized rational statistics.

14. – 15. (Canceled)

16. (Currently Amended) A system as recited in claim 13, wherein the partitioner is further configured to segment [[a]] the digital good into a plurality of overlapping regions.

17. (Currently Amended) A system as recited in claim 13, wherein h of the hashing function is represented by:

$$h_i = \frac{\sum_{j \in R_i} \alpha_{ij} s_j}{\sum_{j \in R_i} b_{ij} s_j}$$

where:

- α_{ij} is the jth element of α_i and α_i are [[a]] pseudorandom generated weight factors;

- b_{ij} is the jth element of b_i and b_i are [[a]] pseudorandom generated weight factors;

- s denotes the digital good of dimension N × 1;

- R_i are the plurality of regions, where $R_i \subseteq \{1,2,...,N\}$.

18. (Currently Amended) A computer-storage medium storing processor-executable instructions that, when executed by a processor, perform acts comprising:

obtaining a digital good;

partitioning the digital good into a plurality of regions, ~~wherein the partitioning comprises segmenting the digital good into a plurality of overlapped regions~~;

calculating rational statistics of one or more [[the]] regions of the plurality of regions, ~~so that~~ wherein:

the rational statistics of ~~a region~~ the one or more regions are representative of ~~the region~~ respective one or more regions, ~~wherein~~

the rational statistics are semi-global characteristics, ~~and stay approximately invariant under any local magnitude-scaling of the digital good~~;

the rational statistics of the one or more regions are based upon a quotient of two weighted, linear, statistical combinations, and

the calculating further comprises:

independently generating pseudo-random weights for the one or more regions based at least upon different secret keys, one different secret key for each of the one or more regions, and

generating weights that are correlated with one another within each of the one or more regions by passing respective pseudo-random weights for each of the one or more regions through an ideal low-pass filter;

quantizing the rational statistics;

marking the digital good with the quantized rational statistics of the plurality of the regions, wherein the marking comprises embedding a watermark via quantization, and

wherein a cutoff frequency of the ideal low-pass filter controls a tradeoff between security and robustness of the watermark, and affects a distortion level of the marked good both in a mean-square-error (MSE) sense and in a perceptual sense.

~~the calculating comprising:~~

~~generating pseudo-random weight factors, *a* and *b*;~~

~~generating the rational statistics of one or more regions of the plurality via a hashing function, *h*, that hashing function having quotient of two weighted, linear, statistical combinations, and where~~

$$h_i = \frac{\sum_{j \in R_i} \alpha_{ij} s_j}{\sum_{j \in R_i} b_{ij} s_j}$$

~~where:~~

~~• α_{ij} is the jth element of α_i and α_i are a pseudo-random generated weight factors;~~

~~• b_{ij} is the jth element of b_i and b_i are a pseudo-random generated weight factors;~~

~~• s denotes the digital good of dimension N × 1;~~

~~R_i are the plurality of regions, where $R_i \subseteq \{1,2,...,N\}$.~~

19. **(New)** A medium as recited in claim 1, wherein the calculating further comprises generating correlated weights from the pseudo-randomly generated weights for each of the one or more regions, the correlated weights being correlated with one another within each of the one or more regions.

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20. (New) A medium as recited in claim 19, wherein the generating comprises passing the pseudo-randomly generated weights for each of the one or more regions to an ideal low-pass filter to generate the correlated weights.

21. (New) A medium as recited in claim 20, wherein the marking comprises embedding a watermark via quantization, and a cutoff frequency of the ideal low-pass filter controls a tradeoff between security and robustness of the watermark.

22. (New) A medium as recited in claim 20, wherein a cutoff frequency of the ideal low-pass filter affects a distortion level of the marked good both in a mean-square-error (MSE) sense and in a perceptual sense.

23. (New) A system as recited in claim 13, wherein the region-statistics calculator is further configured to generate pseudo-random weights for each region of the one or more regions, and the correlated weights associated with each region of the one or more regions are generated by passing respective pseudo-random weights generated for each region to an ideal low-pass filter.

24. (New) A system as recited in claim 23, wherein the digital-goods marker is further configured to embed a watermark onto the digital goods to form the marked good, and a cutoff frequency of the ideal low-pass filter controls a tradeoff between security and robustness of the watermark.

24. (New) A system as recited in claim 23, wherein a cutoff frequency of the ideal low-pass filter affects a distortion level of the marked good both in a mean-square-error (MSE) sense and in a perceptual sense.

25. (New) A system as recited in claim 23, wherein the pseudo-random weights for each region of the one or more regions are generated based at least upon different secret keys, one different secret key for each region.